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ABSTRACT

This document lists the objectives for the Texas educational assessment program in mathematics. Eighteen objectives for exit level mathematics are listed, by category: number concepts (4); computation (3); applied computation (5); statistical concepts (3); geometric concepts (2); and algebraic concepts (1). Then general specifications are listed for test items and test packaging format. Each objective is then presented with a description of the test questions to be developed and of answer choices, and one or two examples of test questions to assess that objectives are given. (MNS)

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Mathematics Objectives and Measurement Specifications 1986-1990 Exit Level

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FOREWORD

As a result of the passage of House Bill 72 by the Second Called Session of the Sixty-Eighth Texas Legislature, numerous changes in the student basic skills assessment program will take place beginning with the 1985-1986 school year.

One of the most significant changes occurs with the exit level test. Satisfactory performance on the Exit Level Examination is required for students to receive a high school diploma.

The learning objectives contained in this document will be measured on the Exit Level Texas Educational Assessment of Minimum Skills (TEAMS) test. These objectives are congruent with the State Board of Education Rules for Curriculum, which outlines the rules and procedures for implementing Section 21.101 of the Texas Education Code. The TEAMS objectives and measurement specifications are provided for use by teachers and other educators responsible for student instruction and for test development specialists involved with the preparation of the TEAMS tests. Beginning with the 1985-1986 school year, the Exit Level TEAMS test will be based on the objectives in this publication.

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TEAMS EDUCATIONAL ASSESSMENT OF MINIMUM SKILLS

EXIT LEVEL MATHEMATICS

List of Objectives

Skill Area: Number Concepts

Objective 1. Select the set of numbers ordered from least to greatest.

Objective 2. Round numbers to a particular place value.

Objective 3. Identify equivalent fractions, decimals, and percents.

Objective 4. Convert numbers from exponential notation to standard notation.

Skill Area: Computation

Objective 5. Solve problems involving addition/subtraction/multiplication of fractions and mixed numbers.

Objective 6. Use the basic operations to solve decimal problems.

Objective 7. Solve problems involving addition of integers.

Skill Area: Applied Computation

Objective 8. Solve word problems involving multiple operations of whole numbers, decimals, fractions, and mixed numbers.

Objective 9. Solve word problems using formulas.

Objective 10. Solve word problems involving proportions.

Objective 11. Solve word problems involving percent.

Objective 12. Solve problems involving metric/customary measurements using the basic operations.

Skill Area: Statistical Concepts

Objective 13. Solve word problems involving averages.

Objective 14. Solve word problems involving simple probability.

Objective 15. Use information from graphs and tables to solve word problems.

Skill Area: Geometric Concepts

Objective 16. Solve problems involving geometric formulas.

Objective 17. Use geometric properties to solve problems involving geometric shapes.

Skill Area: Algebraic Concepts

Objective 18. Solve problems to determine the value of a variable.

EXIT LEVEL MATHEMATICS

General Specifications

I. Test Items

A. Each test item will be followed by a set of four answer choices. One answer choice will be the correct response, and three answer choices will be incorrect responses.

B. Calculators may not be used during the test.

C. A test item will contain no more than 75 words. No sentence will be longer than 20 words. Test items will contain only words in the Texas Education Agency (TEA) cumulative vocabulary list through Grade 10.

D. For all test items, each decimal number less than one will have a zero to the left of the decimal.

E. For all test items, four digit numbers will not include commas. All numerals of five digits or more will include commas.

F. For decimal problems using money, all answer choices will have two decimal places.

G. Word problems shall be free of stereotyping by age, sex, ethnicity, and geographical location.

H. Selections shall represent various ethnic groups of populations in Texas. The three main groups are black, Hispanic, and white.

I. Neither "none of the above" nor "all of the above" shall be used as an answer choice.

J. Problem situations shall be appropriate for twelfth grade students.

K. All fractions shall be written in vertical form.

II. Test Package Format

A. The test shall be printed in black ink on white paper.

B. Graphic displays, their corresponding items, and response choices shall appear on the same or facing pages.

C. Type size shall be appropriate for eleventh and twelfth grade students.

OBJECTIVES AND MEASUREMENT SPECIFICATIONS

Skill Area: Number Concepts

Skill Description

Students will be presented with numeric problems requiring the sequencing of numbers, rounding, identifying equivalencies among number forms, and translating from exponential to standard notation. Students will be asked to select from among four choices the correct answer to the number concepts problem presented.

Objective 1. Select the set of numbers ordered from least to greatest.

Objective 2. Round numbers to a particular place value.

Objective 3. Identify equivalent fractions, decimals, and percents.

Objective 4. Convert numbers from exponential notation to standard notation.

SKILL AREA: NUMBER CONCEPTS

Objective 1

Select the set of numbers ordered from least to greatest.

Description of Test Questions

Test items will direct the student to "Select the set of numbers that is correctly ordered from least to greatest." The numbers to be ordered will be integers and decimals. Eligible numbers may be positive or negative.

Description of Answer Choices

1. Each answer choice will list four numbers.

2. Eligible numbers will be integers and decimals. Numbers may be positive or negative and will not exceed four digits.

3. Any type of eligible number can be included in a single answer choice.

4. The correct answer choice will be the set of four numbers correctly ordered from least to greatest when read from left to right.

5. An incorrect answer choice will be one of the following types:

   a. an incorrect sequence, that is, four numbers that do not follow sequentially from least to greatest or from greatest to least; or

   b. an incorrect direction, that is, four numbers that are sequentially ordered from greatest to least.

Example of Test Questions

Select the set of numbers that is correctly ordered from least to greatest.

A. -23, -11, 0, 5 (correct)

B. 0, -1, -6, -39 (incorrect direction)

C. -14, -20, 8, 26 (incorrect sequence)

D. -34, -20, 7, 0 (incorrect sequence)

SKILL AREA: NUMBER CONCEPTS

Objective 2

Round numbers to a particular place value.

Description of Test Questions

1. A test item will require a number to be rounded to a particular place value. The test item will direct the student to, "Round (number) to the nearest (place value)."

2. Eligible numbers will be whole numbers and positive decimals. Eligible numbers will be between three and five digits.

3. Eligible place values for rounding are the thousands, hundreds, tens, ones, tenths, hundredths, and thousandths place.

Description of Answer Choices

1. The correct answer choice will be the specified number correctly rounded to the specified place value. When rounding the number 5, the correct answer will always be rounded up.

2. An incorrect answer choice will be one of the following types:

   a. an incorrect rounding, that is, a number rounded to the correct place but rounded incorrectly; or

   b. an incorrect place value, that is, a number rounded either correctly or incorrectly to a place value other than the one specified.

3. Each set of answer choices will include incorrect answer choices from both of the categories described in number 2 above.

Example of Test Questions

Round 33.852 to the nearest tenth.

A. 33.9 (correct)

B. 33.8 (incorrect rounding)

C. 33.85 (incorrect place value)

D. 34.0 (incorrect place value)

SKILL AREA: NUMBER CONCEPTS

Objective 3

Identify equivalent fractions, decimals, and percents.

Description of Test Questions

1. A test item will require the conversion of a fraction to a decimal or percent, a decimal to a fraction in simplest form or percent, or a percent to a decimal. The test item will direct the student to, "Express (number) as a (fraction in simplest form, decimal, or percent)."

2. Eligible fractions will have a value of less than one and be limited to those that can be expressed as a terminating decimal with no more than three digits.

3. Eligible decimals will have a value of less than one and be limited to three digits.

4. Eligible percents will fall in the range from .01% to 100%. Decimal percents will not exceed four digits with no more than two digits to the right of the decimal. Percents will be expressed using the symbol (%).

Description of Answer Choices

1. All answer choices for a given test item will be expressed as either fractions, decimals, or percents.

2. All fractions will be presented in simplest form.

3. The correct answer choice will be the fraction, decimal, or percent that is equivalent to the specified number.

4. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. an incorrect simplification, that is, incorrectly simplifying a solution in fractional form;

   c. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error; or

   d. a reciprocal error, that is, a number that is the reciprocal of the correct answer.

Examples of Test Questions

Item 1

Express $\frac{5}{8}$ as a decimal.

A. .625 (correct)

B. .425 (basic operation error)

C. .5 (basic operation error)

D. 1.6 (reciprocal error)

Item 2

Express .235 as a percent.

A. 23.5% (correct)

B. .00235% (misplaced decimal point)

C. .235% (misplaced decimal point)

D. 2.35% (misplaced decimal point)

SKILL AREA: NUMBER CONCEPTS

Objective 4

Convert numbers from exponential notation to standard notation.

Description of Test Questions

1. A test item will require the conversion of a number in exponential notation to an equivalent value in standard notation. The test item will direct the student to, "Simplify (number in exponential notation)."

2. Numbers to be converted to standard notation will be whole numbers from one through 10 with exponents from one through four.

Description of Answer Choices

1. All answer choices will be expressed in standard notation.

2. The correct answer choice will be the number in standard notation that is equivalent to the specified number in exponential notation.

3. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. an incorrect operation, that is, performing an operation other than a required one, specifically, adding rather than multiplying the factor;

   d. an incorrect power, that is, multiplying the factor fewer or more times than indicated by the exponent;

   e. a reversal, that is, reversing the factor with the exponent and either multiplying correctly, or performing an incorrect operation or incorrect power; or

   f. an incorrect procedure, that is, adding the factor and exponent.

4. Each set of answer choices will include incorrect answer choices from at least two of the categories described in number 3 above.

Example of Test Questions

Simplify 3^4.

A. 81 (correct)

B. 12 (incorrect operation)

C. 27 (incorrect power)

D. 64 (reversal)

Skill Area: Computation

Skill Description

Students will be presented with computation problems involving fractions and mixed numbers, decimals, and integers. Students will be asked to select from among four choices the correct answer to the computation problem presented.

Objective 5. Solve problems involving addition/subtraction/multiplication of fractions and mixed numbers.

Objective 6. Use the basic operations to solve decimal problems.

Objective 7. Solve problems involving addition of integers.

SKILL AREA: COMPUTATION

Objective 5

Solve problems involving addition/subtraction/multiplication of fractions and mixed numbers.

Description of Test Questions

1. The test item will direct the student to, "Solve and simplify."

2. Eligible operations will be addition, subtraction, and multiplication.

3. Eligible numbers will not exceed 10. Fractions will be presented in simplest form with a denominator of 32 or less. All numbers will be positive. At least one number will be a mixed number or fraction.

4. Addition and subtraction problems will be presented in either vertical or horizontal format. Multiplication problems will be presented in horizontal format.

5. Addition problems will require the student to add a maximum of three numbers. All other operations will involve no more than two numbers.

6. For subtraction operations, the value of the number that is subtracted will always be less than the value of the number from which it is subtracted.

Description of Answer Choices

1. All fractional answer choices will be presented in simplest form.

2. When a common denominator is required, the same denominator should be used in no more than two answer choices.

3. Incorrect answer choices will be drawn from the following:

   a. a computation error, that is, an error in either the addition, subtraction, or multiplication of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. a common denominator error, that is, an error in selecting the lowest common denominator or in renaming fractions in terms of the lowest common denominator;

   d. an incorrect simplification, that is, incorrectly simplifying a solution in fractional form;

e. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting.

4. Each set of answer choices must include at least two of the error types listed in number 3 above.

Example of Test Questions

Solve and simplify.

$$9\frac{1}{4} - 7\frac{5}{6} = \underline{\qquad\qquad}$$

A. $1\frac{5}{12}$ (correct)

B. $2\frac{5}{12}$ (regrouping error)

C. $1\frac{1}{2}$ (computation error)

D. $1\frac{1}{6}$ (incorrect simplification)

Objective 6

Use the basic operations to solve decimal problems.

Description of Test Questions

1. Eligible operations will be addition, subtraction, multiplication, and division.

2. Eligible numbers for addition and subtraction will not exceed four digits. Eligible numbers for multiplication will not exceed a four-digit number multiplied by a two-digit number. Eligible numbers for division will not exceed a four-digit number divided by a two-digit number. At least one number will be a decimal number.

3. All numbers will be positive.

4. Addition and subtraction problems will be presented in horizontal format. Multiplication problems will be presented in either vertical or horizontal format. Division problems will be presented in the form $X \div Y$ or $Y \overline{)X}$.

5. Addition problems will require the student to add a maximum of three numbers. All other operations will be a maximum of two numbers.

6. For subtraction operations, the value of the number that is subtracted will always be less than the value of the number from which it is subtracted.

Description of Answer Choices

1. Incorrect answer choices will be drawn from the following types of errors:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error;

   d. a misaligned digit, that is, (1) adding or subtracting a digit in one place (e.g., the tens place) to or from a digit in an adjacent place (e.g., the hundreds place), or (2) misaligning partial products;

e. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting; or

f. a switched operand, that is, reversal of the divisor and the dividend.

2. The correct answer choice to all computation problems will be an exact solution with no more than six digits.

Example of Test Questions

26.05 X 20 =

A. 521 (correct)

B. 42 (misplaced decimal point)

C. 52.1 (misplaced decimal point)

D. 53 (regrouping error)

SKILL AREA: COMPUTATION

Objective 7

Solve problems involving addition of integers.

Description of Test Questions

1. Addition will be the only eligible operation. All problems will be presented in horizontal format.

2. Eligible numbers will be integers from -100 to 100.

3. The maximum number of addends will be four. At least one addend will be negative.

4. Negative numbers will be enclosed in parentheses.

Description of Answer Choices

Incorrect answer choices will be drawn from the following types of errors:

1. a computation error, that is, an error in the addition of two numbers;

2. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

3. an incorrect operation, that is, performing an operation other than a required one, such as subtracting rather than adding; or

4. an incorrect sign (computing with integers only), that is, using an incorrect sign on either a correct solution or on a solution obtained as a result of another error.

Example of Test Questions

$(-6) + 33 + (-8) =$

A. 19 (correct)

B. 29 (regrouping error)

C. 31 (basic operation error)

D. 35 (basic operation error)

Skill Area: Applied Computation

Skill Description

Students will be presented with word problems requiring the use of multiple operations, formulas, proportions, percents, and units of measure. At least some of the applied computation problems will be based on content from the area of personal finance. Students will be asked to select from among four choices the correct answer to the applied computation problem presented.

Objective 8. Solve word problems involving multiple operations of whole numbers, decimals, fractions, and mixed numbers.

Objective 9. Solve word problems using formulas.

Objective 10. Solve word problems involving proportions.

Objective 11. Solve word problems involving percent.

Objective 12. Solve problems involving metric/customary measurements using the basic operations.

SKILL AREA: APPLIED COMPUTATION

Objective 8

Solve word problems involving multiple operations of whole numbers, decimals, fractions, and mixed numbers.

Description of Test Questions

1. A test item will involve either two or three computations. Eligible operations include addition, subtraction, multiplication, and division.

2. A test item may involve up to two of the same operations.

3. Eligible numbers will be whole numbers, decimals, fractions, and mixed numbers. All numbers will be positive and will not exceed four digits. Fractions will be limited to a single-digit numerator with values through 10 in the denominator.

4. If decimals and fractions are used in the same problem, fractions will have a numerator of one.

5. All numbers in a given problem need not have the same number of digits or decimal places.

6. Addition operations will require the student to add a maximum of three numbers. All other operations will involve a maximum of two numbers.

7. For subtraction operations, the value of the number that is to be subtracted will always be less than the value of the number from which it is to be subtracted.

8. For multiplication operations, eligible numbers will not exceed a four-digit number multiplied by a two-digit number.

9. For division operations, eligible numbers will not exceed a four digit number divided by a two digit number. Division of fractions and mixed numbers will not be required.

10. Numerical information that is irrelevant to the solution of the word problem will be included in 25 percent of the test items.

Description of Answer Choices

1. Each answer choice will be a whole number, decimal, fraction, or mixed number, labeled with the appropriate unit. All numbers will be positive.

2. The correct answer choice will be no more than six digits and will be the exact solution for the problem presented.

3. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error;

   d. a misaligned digit, that is, (1) adding or subtracting a digit in one place (e.g., the tens place) to or from a digit in an adjacent place (e.g., the hundreds place), or (2) misaligning partial products;

   e. an incorrect order, that is, performing the operations required to solve the problem in the wrong order;

   f. a missing operation, that is, not operating on the data or omitting one of the required operations;

   g. an incorrect data error, that is, performing a necessary operation on the wrong data;

   h. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting;

   i. a common denominator error, that is, an error in selecting the lowest common denominator or in renaming fractions in terms of the lowest common denominator; or

   j. an incorrect simplification, that is, incorrectly simplifying a solution in fractional form.

4. Each set of answer choices must include at least two of the error types listed in number 3 above.

5. Each incorrect answer choice will be an exact solution for one of the error types listed in number 3 above.

Example of Test Questions

Jill is buying a dress on lay-away. She has made three payments of $12.45. The full price of the dress is $55.00. How much does Jill still owe on the dress?

A. $17.65 (correct)

B. $27.65 (regrouping error)

C. $37.35 (missing operation)

D. $42.55 (missing operation)

SKILL AREA: APPLIED COMPUTATION

Objective 9

Solve word problems using formulas.

Description of Test Questions

1. A test item will require the use of a formula to solve for the value of a variable appearing alone on the left-hand side of the formula.

2. A test item will require from one to three values to be substituted into the provided formula.

3. All necessary values for variables in the formula will be provided in the context of a word problem.

4. Variable letters used in the formula will be defined immediately below the provided formula.

5. Formulas will require either two or three computations. These may include the addition, subtraction, multiplication, or division of whole numbers and decimals, and the addition, subtraction, or multiplication of fractions. Fractions will be limited to a single-digit numerator with values through 10 in the denominator. All numbers will be positive and will not exceed four digits.

Description of Answer Choices

1. Each answer choice will be a whole number, decimal, fraction, or mixed number. All numbers will be positive.

2. The correct answer choice will be the exact solution for the problem presented.

3. An incorrect answer choice may be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error;

   d. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting;

e. an incorrect order of operations, that is, performing an operation outside of parentheses prior to an operation inside parentheses, or adding or subtracting before multiplying or dividing;

f. a missing operation, that is, not operating on the data or omitting one of the required operations;

g. a common denominator error, that is, an error in selecting the lowest common denominator or in renaming fractions in terms of the lowest common denominator; or

h. an incorrect simplification, that is, incorrectly simplifying a solution in fractional form.

4. Each set of answer choices must include at least two of the error types listed in number 3 above.

5. Each incorrect answer choice will be an exact solution for one of the error types listed in number 3 above.

Example of Test Questions

Gary is in a bowling league. His average score is 120. Use the formula provided to calculate Gary's bowling handicap.

$H = .8 (200 - a)$
where H = handicap
a = average score

A. 64 (correct)

B. 40 (incorrect order of operations)

C. 80 (missing operation)

D. 144 (regrouping error)

SKILL AREA: APPLIED COMPUTATION

Objective 10

Solve word problems involving proportions.

Description of Test Questions

1. A test item will require the application of a ratio to a quantity.

2. The ratio and quantity will be given in the context of a word problem.

3. The ratio will be in simplified form with a single-digit numerator and up to two digits in the denominator. The given quantity will be a whole number and will not exceed three digits.

Description of Answer Choices

1. Each answer choice will be a whole number.

2. The correct answer choice will be the exact solution for the problem presented.

3. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. a missing operation, that is, not operating on the data or omitting one of the required operations;

   d. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting; or

   e. an incorrect data error, that is, performing a necessary operation on the wrong side.

4. Each set of answer choices must include at least two of the error types listed in number 3 above.

5. The incorrect answer choices will be an exact solution for one of the error types listed in number 3 above.

Example of Test Questions

You are planning an after-game party for 35 people. The owner of the pizza parlor recommends that you purchase 2 large pizzas for every 7 people. How many large pizzas will you need?

A. 10 pizzas (correct)

B. 5 pizzas (missing operation)

C. 7 pizzas (missing operation)

D. 14 pizzas (incorrect operation)

SKILL AREA: APPLIED COMPUTATION

Objective 11

Solve word problems involving percent.

Description of Test Questions

1. A test item will present a word problem and will ask the student to determine a quantity (e.g., 30% of 120 = quantity), or will present a quantity and will ask the student to determine a percent (e.g., 36 out of 120 = percent).

2. For test items that require students to determine a percent, the total quantity will either be provided in the word problem or be able to be computed by a sum of parts. The total quantity will be provided in 25 percent of the test items.

3. A test item will present either:

   a. a percent and ask for the quantity that the percent represents; or

   b. a number that is part of the total quantity and ask for the corresponding percent.

4. Eligible numbers will be whole numbers and positive decimals.

5. Numbers eligible for total quantities will not exceed four digits.

6. Whole number percents will range from 0% to 100%.

Description of Answer Choices

1. Answer choices will either be a whole number percent from 1% through 100%, a whole number, or a decimal number.

2. The correct answer choice will be the exact solution for the problem presented.

3. An incorrect answer choice may be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. a missing operation, that is, not operating on the data or omitting one of the required operations;

d. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting;

e. an incorrect data error, that is, performing a necesssary operation on the wrong data;

f. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error; or

g. a reciprocal error, that is, a number that is the reciprocal of the correct answer.

4. Each set of answer choices must include at least two of the error types listed in number 3 above.

5. The incorrect answer choices will be an exact solution for one of the error types listed in number 3 above.

Examples of Test Questions

Item 1

A survey was conducted to determine students' preferences for lunch foods in the cafeteria. The number of students rating each type of food as their first choice is presented below.

Food	Number of First Choice Ratings
Hamburgers	80
Salads	93
Hot Sandwiches	49
Cold Sandwiches	67
Hot Meals	31

What percent of the students rated hamburgers as their first choice?

A. 25% (correct)

B. 32% (misplaced decimal point)

C. 40% (misplaced decimal point)

D. 80% (missing operation)

Item 2

Representatives of a local college reported that 40% of the applicants were accepted for the coming year. If 2600 students applied, how many were accepted?

A. 1040 students (correct)

B. 104 students (misplaced decimal point)

C. 650 students (misplaced decimal point)

D. 1240 students (basic operation error)

SKILL AREA: APPLIED COMPUTATION

Objective 12

Solve problems involving metric/customary measurements using the basic operations.

Description of Test Questions

1. A test item will require the use of a single operation (addition, subtraction, multiplication, or division) on measurement data presented in either metric or customary units.

2. A test item will not include both metric and customary units.

3. Eligible numbers for use with customary units will be whole numbers, fractions, and mixed numbers. Fractions will be limited to a single-digit numerator with values through 10 in the denominator. All numbers will be positive and will not exceed four digits. The value of mixed numbers will not exceed 1000.

4. Eligible numbers for use with metric units will be whole numbers and positive decimals. Eligible numbers will not exceed four digits.

5. All test items will require a conversion between units of measure within a system. Conversions between metric and customary units will not be permitted.

6. Eligible units of measure will be:

METRIC	CUSTOMARY
Length	
kilometer	mile
meter	yard
centimeter	foot
millimeter	inch
Area	
length units squared	length units squared
Volume and Capacity	
liter	gallon
milliliter	quart
	pint
	cup
	ounce

Weight and Mass

kilogram	pound
gram	ounce
milligram	

Time

year
month
week
day
hour
minute
second

7. Twenty-five percent of the test items will involve metric units.

8. A table of conversions for each system, except for time, will be provided in the test booklet.

Description of Answer Choices

1. Each answer choice will be either:

   a. a whole number or positive decimal in metric units; or

   b. a whole number, positive fraction, or positive mixed number in customary units.

2. The correct answer choice will be the exact solution for the problem presented.

3. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a conversion error, that is, using an incorrect conversion constant; or

   c. a conversion regrouping error, that is, using a correct conversion constant but regrouping between units incorrectly.

4. Each set of answer choices must include at least two of the error types listed in number 3 above.

5. The incorrect answer choices will be an exact solution for one of the error types listed in number 3 above.

Example of Test Questions

Mr. Simpson works at home and reports his hours to his employer. On Tuesday, he worked on three different projects. The time he spent on each project is as follows:

Project A: 2 hours 35 minutes
Project B: 1 hour 28 minutes
Project C: 4 hours 15 minutes

What is the total amount of time Mr. Simpson worked on Tuesday?

A. 8 hours 18 minutes (correct)

B. 7 hours 18 minutes (conversion regrouping error)

C. 8 hours 8 minutes (conversion error)

D. 8 hours 28 minutes (conversion error)

Skill Area: Statistical Concepts

Skill Description

Students will be presented with word problems involving averages, simple probability, and graphs and tables. Students will be asked to select from among four choices the correct answer to the statistical concepts problem presented.

Objective 13. Solve word problems involving averages.

Objective 14. Solve word problems involving simple probability.

Objective 15. Use information from graphs and tables to solve word problems.

SKILL AREA: STATISTICAL CONCEPTS

Objective 13

Solve word problems involving averages.

Description of Test Questions

1. A test item will present up to five objects and their values on a specified measure.

2. The test item will specify that the "mean (average)" be calculated for a set of values.

3. Eligible numbers will be whole numbers or positive decimals. Eligible numbers will not exceed four digits, with a maximum of three digits to the right of the decimal.

4. Test items may include zero as one of the addends.

Description of Answer Choices

1. Each answer choice will be a positive number, either a whole number or a decimal, followed by a descriptor from the word problem.

2. The correct answer choice will be the mean of a set of values.

3. The correct answer choice to all statistical concepts problems will be an exact solution with no more than six digits. For problems involving division, the correct answer will be an exact solution with no more than three decimal places.

4. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. an incorrect operation error, that is, performing an operation other than a required one, such as adding rather than subtracting;

   c. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   d. a missing operation, that is, not operating on the data or omitting one of the required operations;

   e. an incorrect divisor, that is, using an incorrect divisor due to not counting correctly or not counting objects whose value is zero; or

f. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error.

5. Each set of answer choices must include at least two of the error types listed in number 4 above.

6. Procedures used to produce incorrect answer choices will result in exact solutions with no more than three decimal places.

Example of Test Questions

A group of students are comparing their monthly incomes from part-time jobs. What is the mean (average) amount of money earned per month by the following five students?

Student	Monthly Income
John	$25.00
Craig	$10.00
Kris	$12.50
Ellen	$13.00
Janet	$16.50

A. $15.40 (correct)

B. $11.40 (computation error)

C. $13.40 (computation error)

D. $19.25 (incorrect divisor)

SKILL AREA: STATISTICAL CONCEPTS:

Objective 14

Solve word problems involving simple probability.

Description of Test Questions

1. A test item will require the calculation of the probability of an independent event.

2. The test item will present the frequency of the event out of a total number of occasions.

3. Eligible numbers will be whole numbers and will not exceed three digits.

Description of Answer Choices

1. Each answer choice will be a positive fraction in simplest form.

2. The correct answer choice will be the probability of the event described in the problem.

3. An incorrect answer choice will be one of the following types:

   a. an incorrect data error, that is, performing a necessary operation on the wrong data; or

   b. an incorrect simplification, that is, incorrectly simplifying a solution in fractional form.

Example of Test Questions

Lisa's school has 600 students. Next week the principal plans to select 30 students at random to answer a questionnaire. What is the probability that Lisa will be asked to answer the questionnaire?

A. $\frac{1}{20}$ (correct)

B. $\frac{1}{600}$ (incorrect data)

C. $\frac{1}{30}$ (incorrect data)

D. $\frac{1}{10}$ (incorrect simplification)

SKILL AREA: STATISTICAL CONCEPTS

Objective 15

Use information from graphs and tables to solve word problems.

Description of Test Questions

1. A test item will require the application of up to two computations on data obtained from graphs and tables. Eligible operations are addition, subtraction, multiplication, and division. A test item may involve two of the same operations.

2. Addition operations will require the student to add a maximum of five numbers. All other operations will involve a maximum of two numbers.

3. For subtraction operations, the value of the number that is to be subtracted will always be less than the value of the number from which it is to be subtracted.

4. For multiplication operations, eligible numbers will not exceed a four-digit number multiplied by a two-digit number.

5. For division operations, eligible numbers will not exceed a four-digit number divided by a two-digit number.

6. Displays having the following attributes will be eligible for use:

   a. A bar graph will present up to two relationships and will have a maximum of 12 bars. The bars may run vertically or horizontally. Up to 10 grid lines perpendicular to the bars may extend across the graph. Students may be required to estimate a graphed value.

   b. A line graph will be horizontal and may present up to three separate lines. Up to 10 horizontal grid lines may extend across the graph. Students may be required to estimate a graphed value.

   c. A circle graph will contain a maximum of eight segments. Each segment will be labeled with a title and a percentage with up to one decimal place.

   d. Graph and table entries will be whole numbers or positive decimal numbers.

   e. A minimum of five and maximum of 20 numeric entries will be allowed in a single table.

7. Eligible numbers obtained from displays will include whole numbers and positive decimals. Eligible numbers will not exceed four digits with three digits to the right of the decimal place (except where noted).

8. All numbers obtained from displays need not have the same number of digits or decimal places.

Description of Answer Choices

1. Each answer choice will be a whole number or positive decimal with units from the word problem clearly labeled.

2. The correct answer choice will be the solution to the word problem based on a table or graph. The correct answer choice will not exceed six digits.

3. The correct answer choice to all statistical concepts problems will be an exact solution with no more than six digits. For problems involving division the correct answer will be an exact solution to within three decimal places.

4. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting;

   c. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   d. a missing operation, that is, not operating on the data or omitting one of the required operations;

   e. an incorrect order, that is, performing the required operations in the wrong order; or

   f. inaccurate information, that is, selecting incorrect information from a table or graph.

5. Each set of answer choices must include at least two of the error types listed in number 4 above.

6. Procedures used to produce incorrect answer choices will result in exact solutions with no more than three decimal places.

Example of Test Questions

Monthly Health Insurance Rates

Age Group	Sex	Geographic Locations		
		Area 1	Area 2	Area 3
20-24	Male	$ 36.15	$ 40.70	$ 45.20
	Female	42.60	47.95	53.35
25-30	Male	45.35	51.05	56.75
	Female	55.05	62.00	68.75
31-44	Male	59.30	66.65	74.00
	Female	67.20	75.75	84.15

Ernest Johnson's birthday is next week. He will be 25 years old. The table above shows the monthly rates charged by his health insurance company. Assuming Ernest lives in Area 2, by how much will his monthly insurance rate increase when he turns 25 years old?

A. $10.35 (correct)

B. $11.35 (regrouping error)

C. $14.05 (inaccurate information)

D. $51.05 (missing operation)

Skill Area: Geometric Concepts

Skill Description

Students will be presented with problems involving the use of geometric formulas and the properties of geometric shapes. Students will be asked to select from among four choices the correct answer to the geometry problem presented.

Objective 16. Solve problems involving geometric formulas.

Objective 17. Use geometric properties to solve problems involving geometric shapes.

SKILL AREA: GEOMETRIC CONCEPTS

Objective 16

Solve problems involving geometric formulas.

Description of Test Questions

1. A test item will either:

   a. direct a student to "Find the (area, perimeter, circumference, volume) of the (geometric figure) below" and present a display labeled with sufficient information to solve the problem; or

   b. present a word problem describing a geometric figure and require the calculation of an area, perimeter, circumference, or volume of that figure. The words area, perimeter, circumference, or volume need not be explicitly stated in the word problem.

2. A test item will require use of formula(s) to calculate the following:

Calculation	Geometric figure
area	circle rectangle triangle irregular shape (made up of two rectangles or a rectangle and a triangle with the common boundary indicated by a dotted line)
perimeter	polygon
circumference	circle
volume	cylinder rectangular prism

3. Formulas will be provided for all calculations, except the perimeter of a polygon, area of a rectangle, and area of a triangle. Formulas, as well as an approximate value of π, will be presented in a table in the test booklet.

4. Eligible numbers will be whole numbers and positive decimals. Eligible numbers will not exceed four digits with two digits to the right of the decimal place.

5. Symbols/abbreviations may be used for measurement units.

6. Right angles will be indicated with the symbol ⊾.

Description of Answer Choices

1. Each answer choice will be a whole number or positive decimal followed by the correct unit of measure. For problems involving π, each answer choice will be presented both in terms of π and solved using 3.14 for π.

2. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecesssary;

   c. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error; or

   d. an incorrect formula, that is, not using the correct formula to calculate the dimension of the figure.

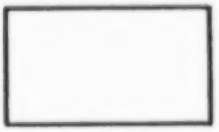
3. Each set of answer choices must include at least two of the error types listed in number 2 above.

4. All square units shall be abbreviated, but only the abbreviation for inches will be followed by a period.

Examples of Test Questions

Item 1

Find the area of the rectangle below.



A. 52.0 cm^2 (correct)

B. 14.5 cm^2 (incorrect formula)

C. 29.0 cm^2 (incorrect formula)

D. 48.4 cm^2 (misplaced decimal point)

Item 2

The Williams family has a garden in the shape of a right triangle. The length of the sides of the garden which form the right angle are 51 feet and 68 feet. The length of the other side is 85 feet. In order to buy enough fertilizer for the garden, they need to know how many square feet are contained in the garden. Find the number of square feet in the garden.

A. 1734 sq ft (correct)

B. 3468 sq ft (incorrect formula)

C. 1700 sq ft (computation error)

D. 2890 sq ft (incorrect forumla)

SKILL AREA: GEOMETRIC CONCEPTS

Objective 17

Use geometric properties to solve problems involving geometric shapes.

Description of Test Questions

1. A test item will require the application of properties of geometric shapes to find the length of a missing side or the size of a missing angle.

2. Eligible applications are:

   a. Use properties of similar polygons to find missing sides or angles.

   B. Use properties of right triangles to find missing sides.

   C. Find a missing angle in a triangle using the property that the sum of the angles of a triangle is 180°.

   D. Find the measure of vertical or supplementary angles formed by intersecting lines.

   E. Find the measure of one of a pair of adjacent angles which form a right angle.

3. A test item will present a display and sufficient information to answer the display relevant question.

4. Eligible numbers will be whole numbers and will not exceed four digits.

5. The statement of the Pythagorean Theorem will not be provided. Test items involving finding the length of a missing side of a right triangle will involve numbers that are perfect squares.

6. Symbols/abbreviations may be used for measurement units.

7. Right angles will be indicated with the symbol ⌟.

Description of Answer Choices

1. Each answer choice will either be the number of degrees in a missing angle, or the length of a missing side.

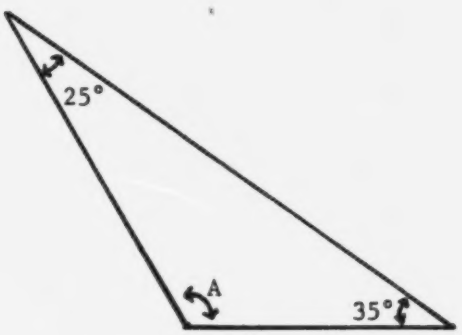
2. The correct answer choice will be the solution to a problem requiring the application of a geometric property.

3. An incorrect answer choice will be one of the following types:

   a. an <u>incorrect property</u>, that is, use of a geometric property other than the correct one; or

   b. a <u>faulty application</u>, that is, failing to correctly apply the geometric property specified.

<u>Example of Test Questions</u>



How many degrees are there in angle A?

A. 120° (correct)

B. 30° (incorrect property)

C. 130° (faulty application)

D. 300° (incorrect property)

Skill Area: Algebraic Concepts

Skill Description

Students will be presented with simple equations and asked to solve for the value of a variable. The solution will require up to two steps. The variable can appear on either side of the equation, but not on both. Students will be asked to select from among four choices the correct answers to the algebraic problem presented.

Objective 18. Solve problems to determine the value of a variable.

SKILL AREA: ALGEBRAIC CONCEPTS

Objective 18

Solve problems to determine the value of a variable.

Description of Test Questions

1. A test item will require students to solve for the value of a variable.

2. The variable will appear on either the right or the left side, but not both sides, of a simple equation.

3. Variable coefficients will be whole numbers or fractions with numerators of one.

4. Up to two operations (addition, subtraction, multiplication, or division) may be required to solve for the value of the variable. Only one operation will be required when a fractional coefficient is used.

5. Numbers eligible for use in the equation are whole numbers, decimals, and fractions. All numbers will be positive and will not exceed two digits.

Description of Answer Choices

1. Each answer choice will be a whole number, decimal, or fraction. All numbers will be positive. Fractions will be simplified and will not be written as mixed numbers.

2. The correct answer choice will be the value of the variable that makes the equation true. Correct answer choices may be whole numbers, decimals, or fractions.

3. An incorrect answer choice will be one of the following types:

   a. a computation error, that is, an error in either the addition, subtraction, multiplication, or division of two numbers;

   b. a regrouping error, that is, failing to regroup when necessary, regrouping incorrectly, or regrouping when unnecessary;

   c. a misplaced decimal point, that is, placing the decimal point in an incorrect position on either a correct solution or on a solution obtained as a result of another error;

   d. a missing operation, that is, performing one, but not both, of the operations needed to solve for the variable;

e. an incorrect operation, that is, performing an operation other than a required one, such as adding rather than subtracting; or

f. a partial operation, that is, performing an appropriate operation on some, but not all, of the eligible terms.

4. Each set of answer choices will include incorrect answer choices from at least two of the categories described in number 3 above.

Example of Test Questions

Solve for the value of y.

$29 = 3y + 6$

A. $\frac{23}{3}$ (correct)

B. $\frac{11}{3}$ (partial operation)

C. $\frac{22}{3}$ (computation error)

D. $\frac{35}{3}$ (incorrect operation)

COMPLIANCE STATEMENT

TITLE VI, CIVIL RIGHTS ACT OF 1964; THE MODIFIED COURT ORDER, CIVIL ACTION 5281, FEDERAL DISTRICT COURT, EASTERN DISTRICT OF TEXAS, TYLER DIVISION

Reviews of local education agencies pertaining to compliance with Title VI Civil Rights Act of 1964 and with specific requirements of the Modified Court Order, Civil Action No. 5281, Federal District Court, Eastern District of Texas, Tyler Division are conducted periodically by staff representatives of the Texas Education Agency. These reviews cover at least the following policies and practices:

(1) acceptance policies on student transfers from other school districts;

(2) operation of school bus routes or runs on a non-segregated basis;

(3) nondiscrimination in extracurricular activities and the use of school facilities;

(4) nondiscriminatory practices in the hiring, assigning, promoting, paying, demoting, reassigning, or dismissing of faculty and staff members who work with children;

(5) enrollment and assignment of students without discrimination on the basis of race, color, or national origin;

(6) nondiscriminatory practices relating to the use of a student's first language; and

(7) evidence of published procedures for hearing complaints and grievances.

In addition to conducting reviews, the Texas Education Agency staff representatives check complaints of discrimination made by a citizen or citizens residing in a school district where it is alleged discriminatory practices have occurred or are occurring.

Where a violation of Title VI of the Civil Rights Act is found, the findings are reported to the Office for Civil Rights, Department of Health, Education and Welfare.

If there is a direct violation of the Court Order in Civil Action No. 5281 that cannot be cleared through negotiation, the sanctions required by the Court Order are applied.

TITLE VII, CIVIL RIGHTS ACT OF 1964; EXECUTIVE ORDERS 11246 AND 11375; TITLE IX, 1973 EDUCATION AMENDMENTS; REHABILITATION ACT OF 1973 AS AMENDED; 1974 AMENDMENTS TO THE WAGE-HOUR LAW EXPANDING THE AGE DISCRIMINATION IN EMPLOYMENT ACT OF 1967; AND VIETNAM ERA VETERANS READJUSTMENT ASSISTANCE ACT OF 1972 AS AMENDED IN 1974.

It is the policy of the Texas Education Agency to comply fully with the nondiscrimination provisions of all federal and state laws and regulations by assuring that no person shall be excluded from consideration for recruitment, selection, appointment, training, promotion, retention, or any other personnel action, or be denied any benefits or participation in any programs or activities which it operates on the grounds of race, religion, color, national origin, sex, handicap, age, or veteran status (except where age, sex, or handicap constitute a bona fide occupational qualification necessary to proper and efficient administration). The Texas Education Agency makes positive efforts to employ and advance in employment all protected groups.